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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,699	09/29/2003	Martin W. Kendig	00SC079US6	6312

23935 7590 07/08/2005

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EXAMINER	
NOGUEROLA, ALEXANDER STEPHAN	
ART UNIT	**PAPER NUMBER**
1753	

DATE MAILED: 07/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/675,699	KENDIG ET AL.	
	Examiner	Art Unit	
	ALEX NOGUEROLA	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/16/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *IDS of 02/25/2005*.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 3 are rejected under 35 U.S.C. 102(a) as being anticipated by Widera et al. ("Volatmmetry in electrolyte-free liquids using a three-electrode probe with a sol-gel matrix," journal of Applied Electrochemistry **33**: 121-124, 2003) ("Widera").

Addressing claim1, Widera discloses a method of correlating changes in the chemical and physical properties of non-electrolytic or weakly electrolytic fluids (title) comprising monitoring the electrical response of the fluid over a period of time to an electric potential applied to the fluid (implied by Figure 2,

which shows current measurements) using a solid state device positioned within the fluid comprising a set of electrodes consisting of at least an anode, cathode and a reference electrode (C, W, R- Figure 1. Depending on the applied voltage either the working electrode or the auxiliary electrode functions as an anode and the other of these two electrodes function as a cathode.), the set of electrodes being encapsulated in a solid electrolyte film (A), and exterior surface of the film being in contact with the fluid (from Figure 1 it is seen that the top surface of the film will necessarily contact the fluid when the device is used).

Addressing claim 3, Widera discloses a device for monitoring the existence of electrolytic species (title) existing in or generated during the use of a non-electrolytic or weakly electrolytic fluids, the device comprising a set of electrodes consisting of at least an anode, a cathode and a reference electrode (C, W, R- Figure 1. Depending on the applied voltage either the working electrode or the auxiliary electrode functions as an anode and the other of these two electrodes function as a cathode.), encapsulated in a solid electrolyte film (A), an exterior surface of the film being in contact with the fluid (intended use; in any event from Figure 1 it is seen that the top surface of the film will necessarily contact the fluid when the device is used).

3. Claims 1, 3, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Kusangi et al. (US 5,273,640) ("Kusangi").

Addressing claim 1, Kusangi discloses a method of correlating changes in

the chemical and physical properties of non-electrolytic or weakly electrolytic fluids (abstract – note that atmospheric gas is being construed as a non-electrolytic or weakly electrolytic *fluid*[1]) comprising monitoring the electrical response of the fluid over a period of time to an electric potential applied to the fluid (implied by Figures 4 and 5, which show current measurements) using a solid state device positioned within the fluid comprising a set of electrodes consisting of at least an anode, cathode and a reference electrode (The various electrodes sets 13-16 and 16-18 (A, B, C, ...) in the figures. Depending on the applied voltage either the working electrode or the auxiliary electrode functions as an anode and the other of these two electrodes function as a cathode), the set of electrodes being encapsulated in a solid electrolyte film (various films 19 and 20 (A,B,C,...)), an exterior surface of the film being in contact with the fluid (from Figures 1-3, 6-8,13-16,21,28,30,31and 34-37 it is seen that the top surface of the film will necessarily contact the fluid when the device is used).

Addressing claim 3, Kusangi discloses a device for monitoring the existence of electrolytic species existing in or generated during the use of a non-electrolytic or weakly electrolytic fluids (abstract – note that atmospheric gas is

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[1] "Main Entry: [2]**fluid**
Function: *noun*
: a substance (as a liquid or gas) tending to flow or conform to the outline of its container"
Merriam-Webster Online Dictionary

being construed as a non-electrolytic or weakly electrolytic *fluid*[2]), the device comprising a set of electrodes consisting of at least an anode, a cathode and a reference electrode (The various electrodes sets 13-16 and 16-18 (A, B, C, ...) in the figures. Depending on the applied voltage either the working electrode or the auxiliary electrode functions as an anode and the other of these two electrodes function as a cathode), encapsulated in a solid electrolyte film (various films 19 and 20 (A,B,C,...)), an exterior surface of the film being in contact with the fluid (intended use; in any event from Figures 1-3, 6-8,13-16,21,28,30,31and 34-37 it is seen that the top surface of the film will necessarily contact the fluid when the device is used).

Addressing claim 4, for the additional limitation of this claim see col. 6:15-19.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

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[2] "Main Entry: **[2]fluid**
Function: *noun*
: a substance (as a liquid or gas) tending to flow or conform to the outline of its container"
Merriam-Webster Online Dictionary

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Discenzo (US 6,286,363 B1) ("Discenzo") in view of Clough ("Measuring the water content of synthetic lubricants with polymer-coated sensors," Analytica Chimica Acta 315 (1995) 15-26) ("Clough") or the CAPLUS abstract of Schiavon et al. ("Solid-state cell for the voltammetric determination of trace electroactive ionic species preconcentrated from highly resistive media at electrodes modified

by ion-exchange coatings," Analytic Chimica Acta (1992), 264(2), 221-8) ("Schiavon I"), CAPLUS abstract of Schiavon et al. ("Amperometric monitoring of sulfur dioxide in low-conductive liquid and air samples by electrodes supported on ion-exchange membranes," Analyst (1991), 116(8), 797-801) ("Schiavon II"), and Schiavon et al. ("Electrodes supported on ion-exchange membranes as sensors in gases and low-conductivlty solvents," Analytica Chimica Acta (1989), 221(1), 27-41) ("Schiavon III").

Addressing claim 1, Discenzo discloses a method of correlating changes in the chemical and physical properties of non-electrolytic or weakly electrolytic fluids (abstract) comprising monitoring the electrical response of the fluid over a period of time to an electric potential applied to the fluid (implied by Figures 3, 4e, col. 6:1-65, and col. 9:53-60, which disclose monitoring the state of a lubricant from signals from the various sensors, including chemical, pH, and conductivity sensors, of a multiple sensing devices) using a state device positioned within the fluid comprising a set of electrodes consisting of at least an anode, cathode and a reference electrode (the chemical sensor comprises counter, working, and reference electrodes (col. 6:40-45) and the electrical conductivity sensor, for example, may comprise four electrodes (col. 6:58-60). Depending on the applied voltage either the working electrode or the auxiliary electrode functions as an anode and the other of these two electrodes function as a cathode.),

Discenzo does not mention a set of electrodes being encapsulated in a solid electrolyte film, and the exterior surface of the film being in contact with the fluid.

Clough and Schiavon I, II, and III disclose encapsulating a solid electrolyte film over a set of electrodes so that the exterior of the film will be in contact with lubricant or other low-conducitlvy liquid. See in Clough the abstract and Figure 1 and Schiavon I, II, and III. It would have been obvious to one with ordinary skill in the art at the time of the invention to provide a film as taught by Clough or Schiavon I, II, or III over a set of electrodes in Discenzo because in the case of Clough, which discloses measuring the water content of the lubricant, Discenzo discloses that the water content in lubricant is an important indicator of the health of the machine being lubricated (col. 6:63-67; col. 11:57-67; and col. 12:20-28), and in the case of Schiavon I, II, or III, Discenzo discloses that knowledge of the additive properties or the presence of contaminants is important in determining whether the lubricant can perform its function (col. 6:55-57; col. 19:34-41; and col. 12:1-28, note lines 13, 26, and 23).

Addressing claim 2, barring evidence to the contrary, such as unexpected results, the voltage applied during monitoring will largely depend on the reduction/oxidation potential of the analyte (note that no particular analyte is being monitored in the claim) or in the case of moisture measurement just optimization. Whether current is monitored at the cathode just depends on whether the analyte is being oxidized or reduced.

Addressing claim 3, Discenzo discloses a device for monitoring the existence of electrolytic species existing in or generated during the use of a non-electrolytic or weakly electrolytic fluids (abstract), the device comprising a set of electrodes consisting of at least an anode, a cathode and a reference electrode (the chemical sensor comprises counter, working, and reference electrodes (col. 6:40-45) and the electrical conductivity sensor, for example, may comprise four electrodes (col. 6:58-60). Depending on the applied voltage either the working electrode or the auxiliary electrode functions as an anode and the other of these two electrodes function as a cathode).

Discenzo does not mention a set of electrodes being encapsulated in a solid electrolyte film, and the exterior surface of the film being in contact with the fluid.

Clough and Schiavon I, II, and III disclose encapsulating a solid electrolyte film over a set of electrodes so that the exterior of the film will be in contact with lubricant or other low-conducitlvy liquid. See in Clough the abstract and Figure 1 and Schiavon I, II, and III. It would have been obvious to one with ordinary skill in the art at the time of the invention to provide a film as taught by Clough or Schiavon I, II, or III over a set of electrodes in Discenzo because in the case of Clough, which discloses measuring the water content of the lubricant, Discenzo discloses that the water content in lubricant is an important indicator of the health of the machine being lubricated (col. 6:63-67; col. 11:57-67; and col. 12:20-28), and in the case of Schiavon I, II, or III, Discenzo discloses that knowledge of the additive properties or the presence of contaminants is important in determining

whether the lubricant can perform its function (col. 6:55-57; col. 19:34-41; and col. 12:1-28, note lines 13, 26, and 23).

Addressing claim 4, for the additional limitation of this claim see the Clough abstract and Schiavon I, II, and III.

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Widera et al. ("Volatmmetry in electrolyte-free liquids using a three-electrode probe with a sol-gel matrix," journal of Applied Electrochemistry **33**: 121-124, 2003) ("Widera").

Widera discloses a method of correlating changes in the chemical and physical properties of non-electrolytic or weakly electrolytic fluids (title) comprising monitoring the electrical response of the fluid over a period of time to an electric potential applied to the fluid (implied by Figure 2, which shows current measurements) using a solid state device positioned within the fluid comprising a set of electrodes consisting of at least an anode, cathode and a reference electrode (C, W, R- Figure 1. Depending on the applied voltage either the working electrode or the auxiliary electrode functions as an anode and the other of these two electrodes function as a cathode.), the set of electrodes being encapsulated in a solid electrolyte film (A), and exterior surface of the film being

in contact with the fluid (from Figure 1 it is seen that the top surface of the film will necessarily contact the fluid when the device is used).

Barring evidence to the contrary, such as unexpected results, the voltage applied during monitoring will largely depend on the reduction/oxidation potential of the analyte (note that no particular analyte is being monitored in the claim). Widera monitors potassium ferricyanide only a demonstration (implied from the last paragrpah in the second column on page 121 bridging to page 122). Whether current is monitored at the cathode just depends on whether the analyte is being oxidized or reduced. See Figure 2.

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kusangi et al. (US 5,273,640) ("Kusangi").

Kusangi discloses a method of correlating changes in the chemical and physical properties of non-electrolytic or weakly electrolytic fluids (abstract – note that atmospheric gas is being construed as a non-electrolytic or weakly electrolytic *fluid*[3]) comprising monitoring the electrical response of the fluid over a period of time to an electric potential applied to the fluid (implied by Figures 4 and 5, which show current measurements) using a solid state device positioned within the fluid comprising a set of electrodes consisting of at least an anode,

[3] "Main Entry: [2]**fluid**
Function: *noun*

cathode and a reference electrode (The various electrodes sets 13-16 and 16-18 (A, B, C, ...) in the figures. Depending on the applied voltage either the working electrode or the auxiliary electrode functions as an anode and the other of these two electrodes function as a cathode) and a reference electrode (various electrodes 15, 18 (A,B,C, ...) in the figures), the set of electrodes being encapsulated in a solid electrolyte film (various films 19 and 20 (A,B,C,...)), an exterior surface of the film being in contact with the fluid (from Figures 1-3, 6-8,13-16,21,28,30,31and 34-37 it is seen that the top surface of the film will necessarily contact the fluid when the device is used).

Barring evidence to the contrary, such as unexpected results, the voltage applied during monitoring will largely depend on the reduction/oxidation potential of the analyte (note that no particular analyte is being monitored in the claim). See col. 6:35-41. Although Kusangi only mentions potentiometry, voltammetry was also a well-known electrochemical measurement technique at the time of the invention. The choice of electrochemical techniques especially potentiometry or voltammetry was within the skill of one with ordinary skill in the art at the time of the invention. Whether current is monitored at the cathode just depends on whether the analyte is being oxidized or reduced. Note that for carbon dioxide the sensor was set at +0.45 volts and for oxygen the sensor was set at –0.6V. See col. 6:35-41.

: a substance (as a liquid or gas) tending to flow or conform to the outline of its container"

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alex Nogueroła
Primary Examiner
AU 1753
Thursday, July 07, 2005